Polish Forum for Prevention Guidelines on Arterial Hypertension

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Introduction

The relationship between blood pressure and the risk of cardiovascular events is continuous and independent of other cardiovascular risk factors. It begins at blood pressure levels (about 110/70 mmHg) commonly classified as optimal. The higher the blood pressure the higher the risk of myocardial infarction, heart failure, stroke and chronic renal failure. Current classification of blood pressure levels is presented in Table I. It is noteworthy that the cut-off value to diagnose hypertension in adults (140/90 mmHg) is the same for all age groups.

According to the results of the NATPOL III PLUS survey, in 2002 the prevalence of hypertension in Polish adults was 29%, 30% were diagnosed as having high normal blood pressure, while 21% had normal and 20% optimal pressure levels. The prevalence of hypertension ranges from a few percent in younger subjects to over 50% in elderly people, in whom the predominant form is isolated systolic hypertension. The awareness of hypertension in the aforementioned survey was 67%. The efficacy of treatment was very low (12.5%) in Natpol III PLUS, which was confirmed in another more recent study on a representative sample of Polish adults – WOBASZ (14.1%).

The treatment of hypertension aims primarily to reduce morbidity and mortality from cardiovascular and renal diseases. The direct purpose is to lower blood pressure to <140/90 mmHg in the general population and <130/80 mmHg in patients with diabetes, chronic renal failure or a history of stroke or myocardial infarction. Important indirect clinical and therapeutic aims are the assessment of cardiovascular risk, searching for secondary causes of hypertension, normalization or delaying the progress of target organ damage, control of the accompanying risk factors and improvement in the quality of life.

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Table I. Definitions and classification of blood pressure levels (mmHg)

Category	Systolic		Diastolic
Optimal	<120	and	<80
Normal	120-129	and/or	80-84
High normal	130-139	and/or	85-89
Grade 1 hypertension	140-159	and/or	90-99
Grade 2 hypertension	160-179	and/or	100-109
Grade 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension	≥140	and	<90

Isolated systolic hypertension should be graded (1, 2, 3) according to systolic blood pressure values in the ranges indicated, provided that diastolic values are <90 mmHg. Grades 1, 2 and 3 correspond to classification in mild, moderate and severe hypertension, respectively. These terms have now been omitted to avoid confusion with quantification of total cardiovascular risk.

	Blood Pressure (mmHg)				
Other risk factors OD or disease	**Normal SBP 120-129 or DBP 80-84**	**High Normal SBP 130-139 or DBP 85-89**	**Grade 1 HT SBP 140-159 or DBP 90-99**	**Grade 2 HT SBP 160-179 or DBP 100-109**	**Grade 3 HT SBP ≥180 or DBP ≥110**
No other risk factors	No BP intervention	No BP intervention	Lifestyle changes for several months then drug treatment if BP uncontrolled	Lifestyle changes for several weeks then drug treatment if BP uncontrolled	Lifestyle changes + Immediate drug treatment
1-2 risk factors	Lifestyle changes	Lifestyle changes	Lifestyle changes for several weeks then drug treatment if BP uncontrolled	Lifestyle changes for several weeks then drug treatment if BP uncontrolled	Lifestyle changes + Immediate drug treatment
≥3 risk factors, MS or OD	Lifestyle changes	Lifestyle changes and consider drug treatment	Lifestyle changes + Drug treatment	Lifestyle changes + Drug treatment	Lifestyle changes + Immediate drug treatment
Diabetes	Lifestyle changes	Lifestyle changes + Drug treatment			
Established CV or renal disease	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment	Lifestyle changes + Immediate drug treatment

Figure 1. Initiation of antihypertensive treatment
Abbreviations: OD – organ damage, MS – metabolic syndrome, HT – hypertension

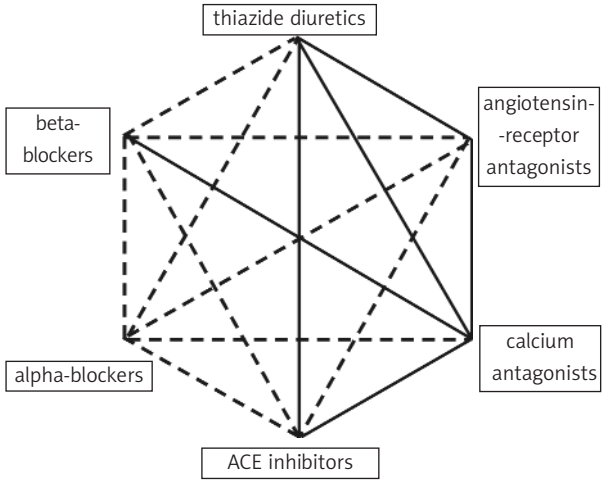
The therapeutic approach in hypertension should consider the following factors: systolic and diastolic blood pressure levels, total cardiovascular risk, the presence of target organ damage, diabetes and chronic renal failure and the history of cardiovascular events. The guide scheme for the initiation of hypertension treatment due to the recent (2007) European Society of Hypertension and European Society of Cardiology (ESH/ESC) guidelines is presented in Figure 1.

Pharmacological treatment of grade 1 hypertension should be initiated with one agent while in grades 2 and 3 the combination of two drugs is frequently required. According to the ESH/ESC 2007 guidelines and the Polish Society of Hypertension 2003 recommendations, the first choice antihypertensive agents belong to the following five major classes: diuretics, beta-blockers, calcium antagonists, angiotensin convertase enzyme inhibitors (ACEI) and angiotensin receptor antagonists. A different standpoint is presented in the American guidelines (Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure, 2003 [1]) which, based on the results of the ALLHAT trial, recommend the initiation of antihypertensive treatment with diuretics. Meanwhile, according to the British Hypertension Society (2005) the choice of first-line therapy should be based on patients' age: ACEIs are preferred <55 years of age, thiazide diuretics and calcium antagonist after 55 years of age. Furthermore, in this approach beta-blockers are not

considered as a first-line therapy. This is based on meta-analyses suggesting less efficacy of this group of antihypertensive agents in reducing the risk of stroke when compared to other main drug classes.

Long-acting agents with once-a-day administration should be preferred in the treatment of hypertension. In the case of inadequate efficacy the dose of a drug can be increased (when tolerance is good) but not to the maximum (due to the risk of side effects), the patient can be switched to an agent from a different class, or a second drug can be added (preferred approach) or if necessary even a third one. In combination, treatment drugs from the same class (even of different organ protective properties) and with similar mechanism of action (e.g. vasodilatation) as well as of similar side effects (except diuretics) should not be given together. Additionally, when three antihypertensive agents are used, diuretics are mandatory. Possible combinations between the main classes of antihypertensive drugs according to the ESH/ESC guidelines are presented in Figure 2.

The choice of antihypertensive agent should be based on constitutional factors (age, race), type of hypertension (i.e. isolated systolic hypertension), the presence of additional cardiovascular risk factors,



The preferred combinations in the general hypertensive population are represented as thick lines.
The frames indicate classes of agents proven to be beneficial in controlled intervention trials.

Figure 2. Possible combinations between some classes of antihypertensive drugs

Table II.

Accompanying disorder	Preferred agents or drugs of choice	Less favourable or **contraindicated agents**
Metabolic syndrome	ACEI, angiotensin receptor antagonist, alpha-blocker	thiazide diuretic *, beta-blocker*
Isolated systolic hypertension	thiazide diuretic, calcium antagonist, ACEI	–
Left ventricle hypertrophy	ACEI, angiotensin receptor antagonist	direct vasodilators
Ischaemic heart disease	ACEI*, beta-blocker	**nifedipine**, direct vasodilators
Previous myocardial infarction	beta-blocker, ACEI, aldosterone antagonist	**nifedipine**, direct vasodilators
Heart failure	ACEI, beta-blocker*, aldosterone antagonist	calcium antagonists, alpha-blocker
Aortic dissection	beta-blocker*	
Peripheral artery disease	ACEI, calcium antagonist, alpha-blocker	beta-blocker
Previous stroke	angiotensin receptor antagonist, ACEI + diuretic	beta-blocker
Diabetes	ACEI, angiotensin receptor antagonist	
Renal failure	ACEI, angiotensin receptor antagonist, loop diuretic	ACEI (Pcr >4 mg/dl), angiotensin receptor antagonist (Pcr >4 mg/dl), aldosterone antagonists
Asthma or COPD	calcium antagonist angiotensin receptor antagonist	**beta-blocker***, ACEI
Gout	ACEI angiotensin receptor antagonist	**thiazide diuretic**, beta-blocker
Osteoporosis	thiazide diuretic	–
Prostate hypertrophy	alpha-blocker	–
Pregnancy	alpha-methyldopa, labetalol, dihydralazine	**ACEI, angiotensin receptor antagonist**, thiazide diuretic
Surgery	beta-blocker	**centrally acting antagonists of the sympathetic system**, calcium antagonist, diuretic

** no class effect (different effects of drugs from one class), ACEI – angiotensin convertase enzyme inhibitors, Pcr – plasma creatinine*

target organ damage (heart, kidney, central nervous system) and concomitant diseases (Table II). In many cases, when indications and contraindications to use one agent in a particular patient are mutually exclusive, the doctor's decision should analyze the benefit-to--harm ratio to choose the best therapeutic option.

Guidelines

1. Arterial hypertension due to its high prevalence, reaching 29% of Polish adults, inappropriate detection rate (67%), low effectiveness of treatment (12%) and strict association with the risk of serious cardiovascular events and deaths is considered as a social disease. Thus blood pressure should be measured and appropriate advice about the need for further systematic control should be given during every doctor visit. The relationship between blood pressure and cardiovascular risk is continuous and starts at blood pressure levels classified as optimal.
2. Diagnosis of hypertension requires recognition of elevated blood pressure to at least 140/90 mmHg in at least two measurements on at least two separate visits. As cardiovascular risk is associated with higher systolic as well diastolic blood pressure, elevation of one of them is sufficient to diagnose hypertension. High normal blood pressure is diagnosed when systolic blood pressure is in the range 130-139 mmHg or diastolic blood pressure is 85-89 mmHg.
3. Essential hypertension characterized by multifactorial aetiology and compound pathogenesis, excluding the possibility to identify and eliminate one specific cause, represents most cases (90-95%) of hypertension. However, in a group of patients, usually younger or representing poor control of hypertension, secondary causes of hypertension should be searched for, as their elimination may lead to persistent blood pressure normalization.
4. The decision making process in hypertension should be based on total cardiovascular risk of an examined patient, which can be assessed using the SCORE system or if possible by identification of other risk factors frequently accompanying hypertension (older age, family history of premature cardiovascular disease, dyslipidaemia, impaired glucose tolerance, abdominal obesity, smoking), evaluation of target organ damage (left ventricular hypertrophy, carotid wall thickening, high carotid-femoral pulse wave velocity, low glomerular filtration rate, slight increase in plasma creatinine, microalbuminuria) and identification of hypertension related cardiovascular diseases (myocardial infarction, heart failure, stroke), renal insufficiency and diabetes.
5. The main purpose of treatment of hypertensive patients is to decrease the risk of death and cardiovascular complications. This requires efficient blood pressure reduction, appropriate control of accompanying cardiovascular risk factors and effort to regress target organ damage. The aim of therapy is to reduce blood pressure to <140/90 mmHg or, in patients with diabetes, renal insufficiency, after stroke or myocardial infarction, <130/80 mmHg. In elderly patients with isolated systolic hypertension the possibility to decrease systolic blood pressure <140 mmHg may be limited by excessive reduction in diastolic blood pressure (60-70 mmHg); thus the lowest, well tolerated levels of systolic blood pressure can be accepted.
6. Blood pressure normalization in hypertensive patients is associated with a reduction of the risk of cerebrovascular events by 30-40%, to the level found in normotensives, while the reduction of the risk of coronary events is lower by 1/3. The reason for this phenomenon and further improvement in prognosis in reference to coronary events in hypertensive patients is thoroughly investigated.
7. Non-pharmacological treatment of hypertension, frequently called lifestyle modification, should be implemented immediately in every patient. It also plays a pivotal role in the prevention of hypertension and consists of body mass normalization (BMI <25 kg/m^2), maintenance or increase in physical activity level to regular aerobic exercise at least 30 minutes a day and for at least 4-5 days a week, smoking cessation, reduction in salt intake <6 g/day, and moderation of alcohol consumption to <20 g of ethanol per 24 h in women and <30 g per 24 h in men. Additionally, in hypertensive patients an increase in fruit and vegetable intake and decrease in fat intake (mainly saturated fat) is recommended. The DASH diet is an example of a diet with an additional blood pressure lowering effect.
8. The pharmacological treatment of hypertension should be implemented immediately when blood pressure is equal to or more than 180/110 mmHg. Over the range of blood pressure values between 140/90 and 180/110 mmHg a decision to start drug treatment depends on total cardiovascular risk and the efficacy of nonpharmacological intervention. Pharmacological treatment is necessary in the case of high or very high risk of cardiovascular incident (>20% in 10 years). However, in clinical practice, most patients with diagnosed hypertension require pharmacological treatment along with lifestyle

modification and its prolonged delay may be harmful. In diabetes antihypertensive drug treatment should be started in all patients with blood pressure of at least 130/80 mmHg.

9. In uncomplicated hypertension in Poland as in most European countries therapy should be initiated with agents from five major classes of antihypertensive drugs: diuretics, beta-blockers, calcium antagonists, angiotensin convertase enzyme inhibitors, angiotensin receptor antagonists, alone or in combination. Long-acting drugs are preferred. In complicated hypertension, beneficial and harmful effects of particular agents on metabolism, target organ damage, cardiovascular and renal complications as well as other accompanying disorders should be considered to choose the most appropriate agent in an individual patient.
10. Monotherapy may be efficient in mild hypertension. However, in most patients with moderate or severe hypertension combination treatment should be prescribed. The low rate of combination treatment is among the causes of poor blood pressure control. The preferred combinations of antihypertensive agents are as follows:
    - angiotensin convertase enzyme inhibitor + calcium antagonist (organ protection),
    - angiotensin convertase enzyme inhibitor or angiotensin receptor antagonist + thiazide diuretic (antihypertensive efficacy, secondary prevention of cerebrovascular events),
    - angiotensin convertase enzyme inhibitor + beta-blocker (secondary prevention of cardiac complications),
    - angiotensin convertase enzyme inhibitor + angiotensin receptor antagonist (nephroprotection).

Patients with hypertension over 50 years of age, with high total cardiovascular risk, diabetes and/or cardiovascular events in their history usually require additional therapy with lipid lowering (statins) and antiplatelet (acetylsalicylic acid in cardiologic dose of 75-150 mg) agents.

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The Polish version of the guidelines as well as the introductory article and comments from specialists and experts can be read in the fifth issue of Forum Profilaktyki and on the website www.pfp.edu.pl. The following authors participated in the aforementioned issue of Forum Profilaktyki:

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